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PORTABLE TELEPHONE WITH AN INTEGRATED VIDEO CAMERA

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PORTABLE TELEPHONE WITH AN INTEGRATED VIDEO CAMERA

[Keitai denwa ittaikei bideo kamera]

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[There are no amendments to this patent.]

* * *

Claims

1. Portable telephone with an integrated video camera wherein a video camera section consisting of a lens and an image pickup element, an image display section, and a portable telephone function section for transmitting and receiving radio telephone communication signals are mounted in a case body, characterized by the fact that the case body consists of a shielding means for covering the mounting section of at least the image display section so that the means can be freely opened and closed.

2. The portable telephone with an integrated video camera of Claim 1, characterized by the fact that the shielding means is formed of a transparent material.

3. Portable telephone with an integrated video camera wherein a video camera section consisting of a lens and an image pickup element, an image display section, and a portable telephone function section for transmitting and receiving radio telephone communication signals are mounted in a case body, characterized by the fact that the case body has a first case body in which the video camera section and a speaker for the portable telephone function section are mounted and a second case body in which the image display section and a microphone for the portable telephone function section are mounted; that the first case body is axially supported on the second case body so that it can be rotated about the horizontal axis of the second case body; and that the video camera section and the speaker for the portable telephone function section mounted in the first case body are arranged in positions that are approximately perpendicular to each other.

4. The portable telephone with an integrated video camera of Claim 3, characterized by the fact that the portable telephone function section has first and second speakers; that the first speaker is axially supported along with the video camera section so that it can be rotated in the first case body; and that the second speaker is arranged at the lower end of the second case body.

5. The portable telephone with an integrated video camera of Claim 4, characterized by the fact that the second speaker is an electrokinetic acoustic transducer.

6. The portable telephone with an integrated video camera of Claim 3, characterized by the fact that the support of the second case body for supporting the first case body has an inclined surface of 1-10°; that the area of the outer surface where the first speaker of the first case body is mounted has approximately the same inclined surface as the inclined surface of the support of the second case body.

7. The portable telephone with an integrated video camera of Claim 1, characterized by the fact that the portable telephone function section has first and second speakers and first and second microphones; that the first speaker and the first microphone of the portable telephone function section are arranged on the display surface of the image display section of the case body; that the second speaker and the second microphone of the portable telephone function section are arranged on the side opposite to the display surface of the image display section of the case body.

8. Portable telephone with an integrated video camera wherein a video camera section consisting of a lens and an image pickup element, an image display section, a portable telephone function section for transmitting and receiving radio telephone communication signals, an operation section, and batteries are mounted in a case body, characterized by the fact that the case body consists of an upper case body in which the video camera section, image display section, and speakers and microphones of the portable telephone function section are mounted, and a lower

case body in which the operation section and the batteries are mounted; that the upper case body and the lower case body are connected in a mutually rotating way; that when the upper case body is closed by rotating, and the video camera section and the image display section are covered by the lower case body.

9. The portable telephone with an integrated video camera of Claim 8, characterized by the fact that the lower case body becomes a support stand of the video camera section mounted in the upper case body.

Detailed explanation of the invention

[0001]

Industrial application field

The present invention pertains to a portable telephone with an integrated video camera that has a video camera section consisting of a lens and an image pickup element, an image display section, and a portable telephone function section for transmitting and receiving radio telephone communication signals mounted in a case body. In particular, it pertains to a video camera for transmitting and receiving images, which are picked up by a video camera section, using portable telephone functions by means of radio waves.

[0002]

Prior art

As a conventional portable telephone with an integrated video camera, there is an "electronic still camera with portable telephone functions" presented in Japanese Kokai Patent Application No. Hei 6[1994]-133081. As the constitution of the presented camera, portable telephone functions are provided in a digital electronic still camera, and picked-up images can be immediately and electrically transmitted to a large-scale storage medium existing in a separate place using a telephone line. Thus, the unit's characteristics are improved, and the number of storage sheets of memory cards is reduced (reduction of the storage capacity). In this camera, speaker, display, dial operation section, and microphone are arranged on the front of the case body, and a lens and an antenna are arranged on the side surface of the head of the case body.

[0003]

Problem to be solved by the invention

In the above-mentioned conventional example, the lens, which is part of the video camera, is arranged on the side surface of the case body, and the display, which is also used as a finder, is fixed to the front of the case body, so that both of them are arranged in a nearly perpendicular state. For this reason, in case a hands-free telephone set is used for communication while also watching the display, the face of a transmitter could not be projected, and the case where it could be used as a video telephone set was not considered. Also, in case the device was used as an ordinary handset telephone set, since the speaker and the display were on the same surface of the case body, if the ear was pressed against the speaker, the cheek contacted the display, so that the display surface was contaminated by oils and fats from the cheek, thereby causing a degradation in picture quality.

[0004]

Accordingly, the present invention provides a portable telephone with an integrated video camera that can project the face of a transmitter when it is used as a hands-free telephone set, and can transmit and receive sharp images without any degradation in picture quality when it is used as a handset telephone set.

[0005]

Means to solve the problem

In order to solve the problems of the above-mentioned conventional example, a video camera section consisting of a lens and an image pickup element, an image display section, and a portable telephone function section for transmitting and receiving radio telephone communication signals (by means of speakers and microphones) are mounted in a case body, and a shielding means (formed of a transparent material) for covering at least the image display section is axially supported on the case body so that it can be opened and closed. Also, the case body has a first case body in which the video camera section and a speaker for the portable telephone function section are arranged and mounted in an approximately perpendicular state and a second case body in which the image display section and a microphone are mounted, and the first case body is axially supported on the second case body so that it can be rotated about the horizontal axis of the second case body. Furthermore, two speakers are built into the case body, and the first speaker can rotate in a body with the video camera section. The second speaker consists of an electrokinetic acoustic transducer and is arranged at the lower end of the case body. Also, the speaker mounting surface of the first case body is an inclined surface of 1-10E, and a first speaker or first microphone of the portable telephone function section is arranged on the surface on which the image display section of the case body is mounted. On the surface opposite to the surface on which the image display section is mounted, a second speaker and a second microphone of the portable telephone function section are arranged.

[0006]

Furthermore, the case body consists of an upper case body having the video camera section and the image display section and a lower case body having an operation section and batteries, and the upper case body and the lower case body are connected in a rotatable way by a hinge.

[0007]

Operation

The shielding means, which is supported on the case body so that it can be opened and closed, covers at least the image display section and prevents the attachment of fingerprints and dust, and the transparent shielding means does not require opening and closing of the cover in order to confirm the display contents of images such as telephone numbers. In the first case body, the video camera section and a receiver (speaker) of the portable telephone function section are arranged in an approximately perpendicular state, and they are axially supported so that they can be rotated round the horizontal axis of the second case body. When the portable telephone with an integrated video camera is used as a handset type telephone set (a method of use in which the

main body is positioned close to the head), the video camera section is rotated inside the case body, and the lens is covered with the case body, so that the lens is prevented from being contaminated by oils and fats or hairs. When this device is used as a handset type telephone set, the electrokinetic acoustic transducer installed at the lower end of the case body acts as a sound collector (microphone). On the other hand, in the hands-free telephone in which the case body is used at a distance from the person, the electrokinetic acoustic transducer acts as a sound emitter (speaker).

[0008]

Also, when this device is used as a handset type telephone set, in the inclined surface of 1-10E of the front upper edge part of the case body, the entire speaker part contacts the earlobe along the inclination of the head of a user and prevents leakage of sounds from the speaker. When this device is used as a handset type telephone set, the speakers and the microphones of the telephone function section arranged on the surface opposite the surface when the image display section of the case body is mounted prevents the contamination of the video camera section and the image display section due to oils and fats or hairs from the cheek and prevents the degradation of the operation section due to contact.

[0009]

Since the video camera section and the image display section of the upper case body are covered by the lower case body by folding up the upper case body and the lower case body which are coupled in a mutually rotatable way, the video camera section and the image display section are protected from the attachment of dust, and the lower case body becomes a support stand for the video camera section.

[0010]

Application examples

Application examples of the present invention are explained in detail with reference to the figures.

Application Example 1

Figure 1 is an entire oblique view showing the case body front of the portable telephone with an integrated video camera of this application example. Figure 2 is a cross section along the line A-A' in Figure 1. Figures 3-5 show an operating state, and Figures 6-8 show the entire state [sic]. A portable telephone with an integrated video camera 1 has a case body and camera head section 20, liquid-crystal display section 8, telephone function section, etc., which are mounted in the case body. The case body has a main case body 2, which is a second case body, and a camera case body 5, which is a first case body. The main case body 2 consists of an upper edge section 4 at which an antenna 6 is installed, a case body upper mid-section 7 on which a liquid-crystal display part 8 is mounted, a case body lower mid-section 9 at which operation buttons 10 are arranged, and a lower case body part 11 on which an electrokinetic transducer 12 is mounted, and these are arranged in order from the upper edge part 4 to the lower case body part 11. A front 33 of the upper edge part 4 of the case body is inclined at an angle of inclination ϵ . In this application example, $\epsilon = 5E$. The operation buttons 10 of the case body lower mid-section 9 consist of ten keys 26 from 0 to 9 for inputting telephone numbers, and function buttons 27 and 28, such as send and end. Telephone set board 14, liquid-crystal display board 15, video camera board 16, etc., are arranged on the inside 13 of the main case body 2. Furthermore, a battery 18 is installed in the lower end rear part 17 of the case body and covered with a battery cover 19. The upper edge part 4 forms a concave part at the central part, and the camera case body 5 is arranged in it. The camera case body 5 fits onto the concave part of the upper edge part 7 of the main case body 2 and is arranged in a freely rotating way.

[0011]

In the camera case body 5, a camera hole 24 is bored into one surface, and on the internal part corresponding to camera hole 24, the camera head section 20 consisting of lens, image pickup element, etc., is arranged. At the same time, an ear speaker 21 and a microphone 22 are mounted in the camera case body 5. When the camera head section is arranged at the position of the camera hole 24 at the same surface as that of the liquid-crystal display 8, the ear speaker 21 is arranged at a position on the same upper surface as the surface of the upper edge part 4 of the case body, on which antenna 6 is arranged. In other words, the surface of the camera head section 20 and the surface 32 of the ear speaker 21 are perpendicular to each other. In this application example, the microphone 22 is arranged on the same surface as that of the camera head section 20.

[0012]

The surface 32 of the ear speaker 21 is inclined at an angle of inclination ϵ . The front of the upper edge part 4 of the case body is cut so that it is the same surface as the ear speaker surface 32, and a slight concave part 35 is attached to the vicinity of a sound hole 34. In other words, when the surface 32 of the ear speaker 21 becomes the front 3 of the main case body 2 by turning the camera case body 5, the front of the upper edge part 4 of the main case body 2 and the surface 32 of the ear speaker 21 of the camera case body 5 all line up along the same inclined surface. The angle of inclination ϵ is fitted to an angle of 1-10E of the earlobe and the cheek protruding from a human head. At the angle of inclination, in case the portable telephone with an integrated video camera 1 is used as a portable telephone set, since the surface 32 of the ear speaker 21 matches the protruded surface of the earlobe and the cheek, the vicinity of the display

cover 25 contacts the cheek, and the ear speaker 21 and the earlobe are in close contact, sound leakage from the ear speaker is reduced.

[0013]

Also, for the overall shape of the main case body 2, as shown in Figure 7, the upper edge part 4 of the case body, at which the camera case body 5 is arranged, becomes narrower with the formation of a slightly rounded part, and the case body upper mid-section 7, on which the display 8 is arranged, is a body whose central part has a slight bulge. The case body lower mid-section 9, at which the operation buttons 10 are arranged, becomes narrower with the formation of a slightly rounded part, and the lower case body part 11, at which the electrokinetic transducer 12 is arranged, has a widening shape toward the end. This type of overall shape, in case this video camera is used as a portable telephone set, is easily carried and does not slide or fall out the hands. Grooves 23 for stopping sliding are carved into the surface of the camera case body 5. The electrokinetic transducer 12 is formed of diaphragm, voice coil, and permanent magnet. If voice signal current is sent to the voice coil, the voice coil is vibrated within a magnetic field of the permanent magnet, and the diaphragm integrated with the voice coil vibrates the air, so that the transducer becomes a speaker. On the contrary, if the diaphragm is vibrated by the voice and the voice coil crosses the magnetic field inside the magnetic field, the voice current generates a voice signal on the voice coil, so that the transducer becomes a microphone. Thus, the transducer is a reversible device. The camera case body 5 is axially supported on the upper edge part 4 of the main case body 2 so that it can be rotated over a range of 270° in the direction of arrow 29 about an axis parallel to the horizontal direction, which is uniformly determined by the liquid-crystal display 8, as a rotational axis.

[0014]

In order to rotate the camera case body 5 with respect to the main case body 2, the main case body 2 can be supported by the left hand, and the liquid-crystal display 8 is held at an angle for easy visibility. The camera case body 5 is gripped by the thumb and the index finger of the right hand and rotated, and the photographing angle of the camera head section 20 is set. At that time, the grooves 23 of the camera case body 5 have a sliding stopping function for the rotational operation. The display cover 25, which can be opened and closed, is axially supported in a rotatable way relative to the main case body 2 in front of the liquid-crystal display 8 of the main case body 2. The display cover 25 is a transparent body, and the display of the liquid-crystal display 8 can still be seen with the cover 25 closed.

[0015]

The operation of the portable telephone with an integrated video camera 1 with such a constitution is explained.

(1) The portable telephone with an integrated video camera 1 is used as a hands-free telephone set (see Figure 1). The camera head section 20 is made to face the case body front 3 by rotating the camera case body 5. The display cover 25 is opened so the liquid-crystal display 8 arranged on the front 3 of the case body can be viewed directly. An operator of the portable telephone with an integrated video camera 1 or a subject in front of the case body front 3 can be photographed by the camera head section 20 and then monitored on the liquid-crystal display 8.

The voice of the subject such as user (photographer) is collected from the microphone 22 adjacent to the camera head section 20. On the other hand, the voice of the other party received by the portable telephone function is reproduced by the electrokinetic transducer 12 arranged at the lower part 11 of the case body. In this case, the ear speaker 21 installed at the camera case body 5 does not operate. On the liquid-crystal display 8, the received image of the other party and the transmitted image of this party are displayed, and communication is possible while viewing the images.

[0016]

(2) The portable telephone with an integrated video camera is used as a video camera in case a subject behind the portable telephone with an integrated video camera 1 is photographed (see Figures 3 and 4). In case the subject behind the portable telephone with an integrated video camera 1 is photographed, the camera case body 5 is rotated in the direction of arrow 29, and the camera head part 20 is rotated towards the back face 30 of the case body. In this case, the liquid-crystal display 8 acts as an electronic viewfinder. The user photographs the subject behind the video camera 1 while monitoring the liquid crystal display 8.

[0017]

(3) The portable telephone with an integrated video camera 1 is used as a handset-type portable telephone set (see Figures 5, 6, and 7). The ear speaker surface 32 of the camera case body 5 is turned to the case body front 3 by rotating the camera case body 5. At that time, the camera head part 20 goes into the main case body 2, and the photographing hole 24 is concealed in the case body interior 13. Therefore, the photographing hole 24 is covered with the main case body 2 so that the lens is protected. Thereby, the lens of the camera head section 20 is protected from the adhesion of oils and fats due to the contact of hairs or from the adhesion of dust. Also, at that time, the power of the camera head section 20 is automatically cut off. The liquid-crystal display 8 is protected by closing the display cover 25. The upper edge front 33 of the case body is inclined at an angle of inclination ϵ . In this application example, $\epsilon = 57^\circ$. The surface of the speaker 21 is aligned at an angle of $1-10^\circ$ of the earlobe and the cheek protruding from the head, and the vicinity of the display cover 25 contacts the cheek so that the ear speaker 21 and the earlobe are in close contact, thereby reducing sound leakage from the ear speaker 21. The ear speaker surface 32 is a cut plane that is the same surface as the upper edge front 33 of the case body. The slight concave part 35 is attached to the vicinity of the sound hole 34.

[0018]

In the main case body 2 of this application example, the upper edge part 4 of the camera case body 5 at which the ear speaker 21 is arranged becomes narrower, the case body upper mid-section 7 at which the display 8 is arranged has a bulge, the case body lower mid-section 9 at which the operation buttons 10 are arranged becomes narrower, and the lower part 1 of the case body at which the electrokinetic transducer 12 is arranged widens toward the end. Thus, if the case body lower mid-section 9 is gripped by the hand, the upper mid-section 7 slips onto the hand. Even if the grip is loosened, there is little danger of dropping the portable telephone with an integrated video camera 1, and the safety of the portable equipment is improved. Also, when the portable telephone with an integrated video camera 1 is placed on a desk, since the lower case

body part 11 has good stability because it widens toward the end, it will not fall down.

[0019]

Application Example 2

Figure 8 is an entire oblique view showing a portable telephone with an integrated video camera 101 in this application example. Figure 9 is an operational illustrative diagram. Figure 10 is a back face view. Figure 11 is a cross section of line D-D'. At the front 103 of the case body 102 of the portable telephone with an integrated video camera 101, liquid-crystal display 104, camera head section 105, first speaker 106, first microphone 107, operation buttons 108, and front cover 109 are arranged. At an upper edge part 110 of the case body 102, an antenna 111 is arranged. The front cover 109 covers the liquid-crystal display 104, camera head section 105, first speaker 106, and first microphone 107. The front cover 109 is axially supported on the upper edge part of the case body 102 via a hinge 112 so that it can be rotated, and it can be held in a state in which the front cover 109 is expanded and opened. The front cover 109 is formed of a transparent material, and even when the front cover 109 is closed, the input contents of the operation buttons 108 can be read out. The operation buttons 108 consist of ten keys 113, upper function button 114, and lower function button 115. The upper function button 114 has functions such as memory, mute, and name, and the lower function button 115 has functions such as send, calling, and end.

[0020]

At the inside 120 of the case body of the portable telephone with an integrated video camera 101, the camera head section 105 and an ear speaker 117 are arranged at the same part as the upper antenna 111, the liquid-crystal display 104 consisting of a transmitting liquid crystal panel 124 and a back light 125, a liquid-crystal display board 122, and a video camera board 123 are arranged at the intermediate part, and the operation buttons 108, portable telephone board 121, microphone 118, and battery (not shown in the figure) are arranged at the lower part. The video camera section 105 is fixed to the case body 102 and is not movable.

[0021]

Figure 9 shows a state in which the front cover 109 is expanded and opened. In case the portable telephone with an integrated video camera 101 is used as a hands-free-type portable telephone set by separating from the face, a voice input into the first microphone 106 [sic; 107] and a voice output from the first speaker 106 are made possible by opening the front cover 109. On the back face of the portable telephone with an integrated video camera 101 with such a constitution, as shown in Figure 10, second ear speaker 117, second microphone 118, and battery cover 119 are arranged on the back face 116 of the case body. In case the portable telephone with an integrated video camera 101 is used as a handset-type portable telephone, the ear contacts the second ear speaker 117 of the back face 116 of the case body, and the mouth is close to the second microphone 118.

[0022]

Application Example 3

Figure 12 is an entire oblique view showing a portable telephone with an integrated video camera 201, and Figure 13 is a cross section showing a closed state. A case body 202 of the portable telephone with an integrated video camera 201 consists of an upper case body 203 and a lower case body 204. The upper case body 203 and the lower case body 204 are connected by a hinge 205, and they can be mutually rotated. In the upper case body 203, liquid-crystal display 207, camera head section 208, speaker 209, and microphone 210 are arranged on case body front face 206. Also, an antenna 214 is arranged at an upper edge part 213 of upper case body 203. At the lower case body 204, operation buttons 211 and a battery cover 212 are arranged. The operation buttons 211 consist of ten keys 215, upper function button 216, and lower function button 217. The upper function button 216 has functions such as memory, mute, and name, and the lower function button 217 has functions such as send, calling, and end. As the internal constitution of the portable telephone with an integrated video camera 201, as shown in Figure 13, the camera head section 208, liquid-crystal display 207, liquid-crystal display board 219, and video camera board 220 are oriented in the direction of the antenna 214 on the inside 218 of the upper case body. On the inside 221 of the lower case body, operation buttons 211, telephone board 222, and battery 223 are arranged.

[0023]

In case the portable telephone with an integrated video camera 201 is placed on a desk and used as a hands-free-type portable telephone by separating it from the face, the lower case body 204 is placed on the desk, the upper case body 203 is expanded and opened by turning via the hinge 205, and the liquid-crystal display 207 is set at an angle for easy visibility. In this use state, the lower case body 204 becomes a support stand of the upper case body 203 at which the camera head section 208 is arranged. Then, when it is not used, the upper base body 203 is bent by the hinge 205 and arranged on top of the lower case body 204 (the state of Figure 13). The camera head part 208 of the upper case body 203 and the liquid-crystal display 207 are covered with a lower case body front 224 at which the operation buttons 211 are arranged. Therefore, when the portable telephone with an integrated video camera 201 is carried, the lens of the video camera section 208 and an image display surface 225 of the liquid-crystal display 207 can be protected from the contact of fingers or the attachment of dust.

[0024]

Effect of the invention

The portable telephone with an integrated video camera of the present invention has the following effects.

(1) Since the shielding means, which cover the video camera section and the image display section of the case body, can be installed so that it can be opened and closed, the attachment of fingerprints and dust on the lens of the video camera section and the display of the image display section can be prevented.

(2) When the portable telephone with an integrated video camera is used as a handset type telephone set, the transparent cover of the case body can prevent the image display section from the attachment of oil and fat from the cheek and display contents such as telephone numbers can

be confirmed while the cover is closed.

(3) Since the camera case body (first case body), in which the video camera part and the ear speaker are arranged, is axially supported in a rotatable way on the main case body (second case body), when the portable telephone with an integrated video camera is used as a handset type telephone set, that is, when the image input means is not used, the video camera is rotated into the case body, and the lens is covered by the case body so that the contamination of the lens due to the contact of user hair is prevented.

[0025]

(4) When the portable telephone with an integrated video camera is used, the electrokinetic acoustic transducer, which is a reversible device arranged at the lower end of the case body, is used as a sound collector (microphone). On the other hand, in the hands-free telephone set used by separating the case body from the face, the transducer can be used as a voice generator (speaker). Thus, the number of required microphones can be reduced by one.

(5) Since the upper edge part of the case body of the portable telephone with an integrated video camera has an inclined shape of 1-10E, when the video camera is used as a handset type telephone set, the ear speaker is in total contact with the earlobe so that leakage of the voice signal is reduced.

(6) When the portable telephone with an integrated video camera is used as a handset type telephone set by arranging the speaker and the microphone of the portable telephone function section on the surface opposite to the surface on which the image display section of the case body is mounted, the contamination of the video camera section and the image display section due to oil and fat from hair and the cheek is prevented, so that the degradation of the operation section due to contact is prevented.

[0026]

(7) In the portable telephone with an integrated video camera in which the upper case body and the lower case body can be rotated, when it is not in use, it is folded, so that the video camera section of the upper case body and the surface of the above-mentioned image display section can be covered with the lower case body, thereby protecting the video camera section and the image display section from the attachment of dust.

(8) When the upper case body and the lower case body are expanded and opened, the lower case body becomes a support stand of the upper case body that contains the camera head section.

Brief description of the figures

Figure 1 is an entire oblique view showing the first application example of the present invention.

Figure 2 is a cross section along the line A-A' in Figure 1.

Figure 3 is an operational illustrative diagram of Figure 1.

Figure 4 is a cross section along the line B-B' in Figure 3.

Figure 5 is an operational illustrative diagram of Figure 1.

Figure 6 is a cross section along the line C-C' in Figure 5.

Figure 7 is a front view of Figure 5.

Figure 8 is an entire oblique view showing the second application example of the present invention.

Figure 9 is an operational illustrative diagram of Figure 8.

Figure 10 is an oblique view from the back face of Figure 8.

Figure 11 is a cross section along the line D-D' in Figure 10.

Figure 12 is an entire oblique view showing the third application example of the present invention.

Figure 13 is a central cross section of Figure 12.

Explanation of symbols

1, 101, 201	Portable telephone with an integrated video camera
2, 102, 202	Main case body
4, 110, 213	Upper edge part
5	Camera case body
8, 104, 207	Liquid-crystal display
10, 108, 211	Operation buttons
12	Electrokinetic acoustic transducer
20, 105, 208	Camera head section
21, 117	Ear speaker
22, 107, 118, 210	Microphone
25	Display cover
109	Front cover
106, 209	Speaker

//insert figure 1//

Figure 1

Key:	1	Portable telephone with an integrated video camera
	2	Main case body
	4	Upper edge part

- 5 Camera case body
- 8 Liquid-crystal display
- 10 Operation button
- 12 Electrokinetic acoustic transducer
- 20 Camera head section
- 21 Ear speaker
- 25 Display cover
- 29 Rotating direction

//insert figure 2//

Figure 2

- Key:
- 1 Portable telephone with an integrated video camera
 - 2 Main case body
 - 5 Camera case body
 - 8 Liquid-crystal display
 - 10 Operation button
 - 12 Electrokinetic acoustic transducer
 - 14 Telephone board
 - 15 Liquid-crystal display board
 - 16 Video camera board
 - 20 Camera head section
 - 21 Ear speaker
 - 25 Display cover
 - 29 Rotating direction

//insert figure 3//

Figure 3

Key:	1	Portable telephone with an integrated video camera
	2	Main case body
	4	Upper edge part
	5	Camera case body
	19	Battery cover
	20	Camera head section
	22	Microphone
	29	Rotating direction

//insert figure 4//

Figure 4

Key:	1	Portable telephone with an integrated video camera
	2	Main case body
	5	Camera case body
	8	Liquid-crystal display

- 10 Operation button
- 12 Electrokinetic acoustic transducer
- 14 Telephone board
- 15 Liquid-crystal display board
- 16 Video camera board
- 20 Camera head section
- 21 Ear speaker
- 25 Display cover
- 29 Rotating direction

//insert figure 5//

Figure 5

- Key:
- 1 Portable telephone with an integrated video camera
 - 2 Main case body
 - 4 Upper edge part
 - 5 Camera case body
 - 8 Liquid-crystal display
 - 10 Operation button
 - 12 Electrokinetic acoustic transducer
 - 21 Ear speaker
 - 25 Display cover
 - 29 Rotating direction

//insert figure 6//

Figure 6

Key:	1	Portable telephone with an integrated video camera
	2	Main case body
	5	Camera case body
	8	Liquid-crystal display
	10	Operation button
	12	Electrokinetic acoustic transducer
	14	Telephone board
	15	Liquid-crystal display board
	16	Video camera board
	20	Camera head section
	21	Ear speaker
	25	Display cover
	29	Rotating direction

//insert figure 7//

Figure 7

Key:	1	Portable telephone with an integrated video camera
	2	Main case body
	4	Upper edge part
	5	Camera case body
	8	Liquid-crystal display
	10	Operation button
	12	Electrokinetic acoustic transducer
	21	Ear speaker
	25	Display cover

//insert figure 8//

Figure 8

Key:	101	Portable telephone with an integrated video camera
	102	Case body
	104	Liquid-crystal display
	105	Camera head section
	106	Speaker
	107	Microphone
	109	Front cover
	112	Hinge

//insert figure 9//

Figure 9

Key:	101	Portable telephone with an integrated video camera
	102	Case body
	104	Liquid-crystal display
	105	Camera head section
	106	Speaker
	107	Microphone
	109	Front cover
	112	Hinge

//insert figure 10//

Figure 10

Key:	101	Portable telephone with an integrated video camera
	102	Case body
	112	Hinge

- 117 Ear speaker
- 118 Microphone

//insert figure 11//

Figure 11

- Key:
- 101 Portable telephone with an integrated video camera
 - 102 Case body
 - 104 Liquid-crystal display
 - 105 Camera head section
 - 109 Front cover
 - 112 Hinge
 - 117 Ear speaker
 - 118 Microphone

//insert figure 12//

Figure 12

//insert figure 13//

Figure 13